

corresponding to up-to-date technological achievements. Particularly, the energy for signal transmission will surely be increased on any satellite. Each TV station should provide a compatible service for guaranteeing TV program signal reception to any type receivers ranging from today's common ones to future advanced ones. The signal transmission system of the present invention can provide a compatible broadcast service of both the existing NTSC and HDTV systems and also, ensure a future extension to match mass [date] data transmission.

Please amend the paragraph beginning in Column 82, line 38 as follows:

The present invention concerns much on the frequency utilization than the energy utilization. The signal receiving sensitivity of each receiver is arranged [different] differently depending on a signal state level to be received so that the transmitting power of a transmitter needs not be increased largely. Hence, existing satellites which offer a small energy for reception and transmission of a signal can best be used with the system of the present invention. The system is also arranged for performing the same standards corresponding to an increase in the transmission energy in the future and offering the compatibility between old and new type receivers. In addition, the present invention will be more advantageous for use with the satellite broadcast standards.

IN THE CLAIMS:

Please cancel claims ~~18-23~~ without prejudice or disclaimer of the subject matter therein, and add new claims 24-29 as follows.

¹³~~24~~. A signal transmission apparatus for transmitting a first data stream and a second data stream, comprising:

- a modulator operable to assign each of the first and second data streams to a respective constellation in a vector space diagram to produce modulated signals wherein the number of signal points of the constellation for the first data stream is different from the number of signal points of the constellation for the second data stream, and

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- a transmitter operable to transmit the modulated signals, wherein the first data stream has a synchronization data and data for demodulation for demodulating the modulated signals corresponding to the second data stream, and wherein the synchronization data is located at the beginning of the first data stream, and the data for demodulation follows the synchronization data.

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A signal receiving apparatus, comprising:

- a receiver operable to receive a transmitted signal to produce a received signal, the received signal having information of a first data stream and a second data stream, wherein each data stream is assigned to a respective constellation in a vector space diagram, the number of signal points of the constellation for the first data stream is different from the number of signal points of the constellation for the second data stream, and wherein the first data stream has a synchronization data and data for demodulation for demodulating the received signal corresponding to the second data stream, the synchronization data is located at the beginning of the first data stream, and the data for demodulation follows the synchronization data; and

- a demodulator operable to demodulate the received signal to produce the first data stream and the second data stream, wherein said demodulator produces the second data stream according to the data for demodulation.

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A signal transmission system comprising a signal transmission apparatus and a signal receiving apparatus,

said signal transmission apparatus for transmitting a first data stream and a second data stream, comprising:

- a modulator operable to assign each of the first and second data streams to a respective constellation in a vector space diagram to produce modulated signals, wherein the number of signal points of the constellation for the first data stream is different from the number of signal points of the constellation for the second data stream, and

- a transmitter operable to transmit the modulated signals, wherein the first data stream has a synchronization data and data for demodulation for demodulating the modulated signals

corresponding to the second data stream, and wherein the synchronization data is located at the beginning of the first data stream, and the data for demodulation follows the synchronization data;

said signal receiving apparatus, comprising:

- a receiver operable to receive a transmitted signal to produce a received signal; and

- a demodulator operable to demodulate the received signal to produce the first data stream

and the second data stream, wherein said demodulator produces the second data stream according to the data for demodulation.

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~~27.~~

A signal transmission method for transmitting a first data stream and a second data stream, comprising:

- assigning each of the first and second data streams to a respective constellation in a vector space diagram to produce modulated signals wherein the number of signal points of the constellation for the first data stream is different from the number of signal points of the constellation for the second data stream, and

- transmitting the modulated signals, wherein the first data stream has a synchronization data and data for demodulation for demodulating the modulated signals corresponding to the second data stream, and wherein the synchronization data is located at the beginning of the first data stream, and the data for demodulation follows the synchronization data.

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~~28.~~

A signal receiving method comprising:

- receiving a transmitted signal to produce a received signal, the received signal having information of a first data stream and a second data stream, wherein each data stream is assigned to a respective constellation in a vector space diagram, the number of signal points of the constellation for the first data stream is different from the number of signal points of the constellation for the second data stream, and wherein the first data stream has a synchronization data and data for demodulation for demodulating the received signal corresponding to the second data stream, the synchronization data is located at the beginning of the first data stream, and the data for demodulation follows the synchronization data; and

- demodulating the received signal to produce the first data stream and the second data stream, wherein said demodulating produces the second data stream according to the data for demodulation.

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A signal transmission and receiving method comprising a signal transmission method and a signal receiving method,

said signal transmission method for transmitting a first data stream and a second data stream, comprising:

- assigning each of the first and second data streams to a respective constellation in a vector space diagram to produce modulated signals wherein the number of signal points of the constellation for the first data stream is different from the number of signal points of the constellation for the second data stream, and

- transmitting the modulated signals, wherein the first data stream has a synchronization data and data for demodulation for demodulating the modulated signals corresponding to the second data stream, and wherein the synchronization data is located at the beginning of the first data stream, and the data for demodulation follows the synchronization data;

said signal receiving method, comprising:

- receiving a transmitted signal to produce a received signal,

- demodulating the received signal to produce the first data stream and the second data stream, wherein said demodulating produces the second data stream according to the data for demodulation.